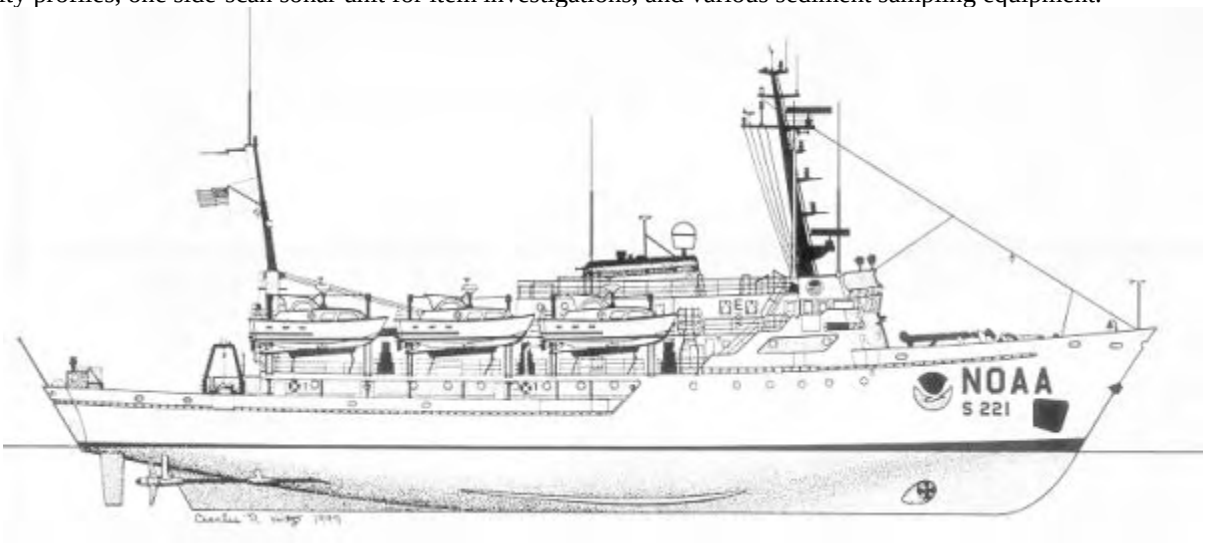
RAINIER

NOAA Ship RAINIER is designed and outfitted primarily for conducting hydrographic surveys in support of nautical charting. Scientific equipment normally aboard is limited to equipment that supports these survey operations. The ship operates off the U.S. Pacific Coast, and in Alaskan coastal waters. **RAINIER** is named for Mount Rainier.
RAINIER is equipped with an intermediate depth multibeam swath survey system. She carries six aluminum survey launches equipped with multibeam swath and single beam echo sounders and a hydrographic data acquisition system. She also has three small boats providing support to shore stations and dive operations. Seven crew members are trained as certified NOAA divers. Other equipment to support hydrographic survey operations includes five CTDs used for sound velocity profiles, one side-scan sonar unit for item investigations, and various sediment sampling equipment.



Line Drawing by Bob Hitz

Design

- Designer: Maritime Administration
- Builder: Aerojet-General Shipyards, Jacksonville, FL
- Launched: March 1967
- Delivered: April 1968
- Commissioned: October 1968
- Hull Number: S 221
- Call Letters: WTEF
- Home Port: Seattle, WA
- Length (LOA): 70.4 m (231 ft.)
- Breadth (moulded): 12.8 m (42 ft.)
- Draft, Maximum: 4.4m (14.3 ft.)
- Hull: Welded steel/ice strengthened
- Displacement: 1,800 tons
- Gross Tonnage: 1,591
- Net Tonnage: 578

Speed & Endurance

- Cruising Speed: 12 knots
- Range: 5,898 nmi
- Endurance: 22 day
- Endurance Constraint: Stability

Complement

- Commissioned Officers: 10
- Crew: 35
- Licensed Engineers: 4
- Scientists: 4 (Max)

Food-Service Seating

- Wardroom: 12
- Technicians Mess: 18
- Ship's Officers Mess: 11
- Crew's Mess: 18

Berthing Capacity

- Single staterooms: 5
- Four bunk rooms: 9
- Double staterooms: 18
- Total bunks: 79

Medical Facilities

- Emergency and first-aid equipment aboard, administered by trained vessel personnel.

Scientific Laboratory Facilities

- Dry Oceanographic lab: 240 sq. ft.

Diving Equipment

- Onboard dive air compressor
- 17 SCUBA tanks
- 7 NOAA certified divers

Cranes and Booms

- Telescoping Boom Crane
  - Quantity: 2
  - Manufacturer: Skagit
  - Drive: Electrohydraulic
  - Location: Foredeck, Port and Starboard
  - Boom length: 25 ft.
  - Lifting capacity: 2,500 lbs (boom extended)
- Fixed Length Crane
  - Quantity: 1
  - Manufacturer: Skagit
  - Drive: Electric
  - Location: Aft Mast
  - Boom length: 40 ft.
  - Lifting capacity: 5,000 lbs

Winches

- Oceanographic Winch
  - Manufacturer: Northern Line
  - Drive: Electrohydraulic
  - Location: Main Deck, Starboard Quarter
  - Line speed: 0-400 ft./min.
  - Maximum pull: 1,000 lbs.
  - Drum capacity: 30,000 ft. of 3/16 in. wire rope

A-Frame

- Type: Movable
  - Quantity: 1
  - Drive: Electrohydraulic
  - Location: Main Deck, Strb. Qtr.
  - Clearance over side: 3 ft.

Ground Tackle

- Bower Anchor
  - Quantity: 2
  - Type: Stockless
  - Weight: 4,850 lbs
- Anchor Chain
  - Quantity: 2
  - Size and type: 1 3/8 inch stud link
  - Length: 165 fathoms

Launches and Small Boats

- Aluminum Survey Launch
  - Quantity: 4
  - Manufacturer: The Boatyard (Jensen)
  - Length: 29 ft.
  - Propulsion: Diesel
  - Special Features: Power isolation protection for scientific equipment.
- Aluminum Survey Launch
  - Quantity: 1
  - Manufacturer: The Boatyard (Jensen)
  - Length: 29 ft.
  - Propulsion: Diesel/Jet Drive
  - Special Features: Power isolation protections for scientific equipment.
- Aluminum Survey Launch
  - Quantity: 1
  - Manufacturer: American Eagle (Munson)
  - Length: 29 ft.
  - Propulsion: Diesel/Hamilton Jet Drive
  - Special Features: Power isolation protections for scientific equipment.
- Aluminum Open Boat
  - Quantity: 1
  - Manufacturer: SeaArk
  - Length: 19 ft.
  - Propulsion: Gasoline Outboard
- Aluminum Open Boat
  - Quantity: 1
  - Manufacturer: MonArk
  - Length: 17 ft.
  - Propulsion: Gasoline Outboard
- Aluminum SAFE Boat
  - Quantity: 1
  - Manufacturer: American Eagle
  - Length: 19 ft.
  - Propulsion: Gasoline Outboard
- Inflatable Open Boat
  - Quantity: 1
  - Manufacturer: Zodiak
  - Length: 13 ft.
  - Propulsion: Gasoline Outboard

Engineering

General

- Cruising Speed: 12 knots
- Range: 5,898 nmi
- Power: 2,400 hp
- Fuel Capacity: 107,000 gal.
- Fuel Consumption: 120 gal./hr.
- Fuel Type: #2 diesel
- Endurance: 22 days
- Endurance Constraint: Stability

Propulsion Plant

- Main Propulsion
  - Type: Geared Diesel
  - Quantity: 2
  - Manufacturer: General Motors EMD
  - Rated power (each): 1,200 hp
- Propellers
  - Type: Controllable Pitch
  - Quantity: 2
  - Diameter: 8.5 ft.
  - Blades: 3
- Auxiliary Propulsion
  - Type: Through Hull Bow Thruster
  - Quantity: 1
  - Manufacturer: Detroit Diesel/Bird Johnson
  - Drive: Geared
  - Rated Power: 200 hp

Freshwater System

- Storage capacity: 16,000 gal.
- Normal consumption: 3,500 gal/day
- Evaporators
  - Quantity: 2
  - Type: Waste Heat/Evaporative Distillers
  - Manufacturer: Alpha Lavel
  - Maximum Production: 7,000 gal/day

Pollution Control

- Sewage Waste Control
  - Type: Electrocatalytic
  - Manufacturer: Sigma Chapman Inc.
  - Holding Capacity: 8,000 gal
- Oily Waste Control
  - Type: Oily water separator
  - Manufacturer: SRS
  - Holding Capacity: 1,700 gal

Electrical System

- Ship Service Generator
  - Quantity: 2
  - Manufacturer: Detroit Diesel/GE
  - Output Voltage: 450 VAC, 60 Hz, 3Ø
  - Power Rating: 300 kW
- Emergency Generator
  - Quantity: 1
  - Manufacturer: Detroit Diesel/GE
  - Output Voltage: 450 VAC, 60 Hz, 3Ø
  - Power Rating: 75 kW
- Electrical Service
  - 450 VAC, 3Ø
  - 120 VAC, 3Ø
  - 120 VAC, 1Ø
  - 120 VAC, 1Ø uninterruptible power for scientific equipment.

Communications

- VHF-FM Marine Band Transceivers
- HF Marine Band Transceivers
- HF Alarm Watch Radio Receiver (2182 kHz)
- Radio Teletype Capability
- Weather Facsimile Receiver
- NAVTEX Receiver
- Cellular Telephone
- Portable VHF-FM transceivers
- INMARSAT Standard B Radio Transceiver
- INMARSAT Standard C Radio Transceiver
- Emergency Position Indicator Radio Beacons (Class 1 and Mini-B)
- Search and Rescue Transponders (X-Band Radar Frequency)
- E-mail (RAINIER's E-mail address is: NOAA.Ship.Rainier@noaa.gov)

Navigation

- X-Band Radar with an ARPA display.
- Differential Global Positioning System (DGPS) Receivers
- Electronic Chart Navigation System (ECS)
- Gyrocompass
- Tides and Currents Prediction Software

Scientific Equipment

- Sea-Bird Electronics, Inc. SBE 19, SEACAT CTD Profilers
- Shipboard Environmental *Data* Acquisition System (SEAS)
- Air and Seawater Temperature Sensors
- Pentium Pro 200 MHz PC's with Windows 98 operating system
- Power isolation protection for scientific equipment.

Survey Equipment

- CSi FBX-2 Radio Beacon Receiver
- CSi MBX-2 Radio Beacon Receiver
- Knudsen Engineering Limited 320M Marine Echosounder
- RESON 8101 SONAR Processor
- SeaBeam 1050 D MKII
- SeaBeam 1180
- Trimble DSM212L
- TSS Position and Orientation System POS/MV
- TSS Motion Sensor Type 335B
- TSS 333/335 H-R-P Sensor Active Junction Box
- SeaBird Electronics SBE 19 SEACAT CTD Profilers
- Monitor Repeaters for coxswains
- Hummingbirds
- Digital Cameras

Software

- Acquisition Software
  - Hypack Max Survey Data Acquisition Program
  - POS/MV Controller for positioning
  - Isis Software for multibeam acquisition
  - Hydrostar for multibeam acquisition
- Processing Software
  - Hydrosoft Software for singlebeam data manipulation and conversion
  - CARIS HIPS/HDCS with Exceed for data processing and analysis
  - MapInfo for data plotting and analysis
- Utilities
  - Tides and Currents for Windows
- Horizontal Control Software
  - TSIP Talker
  - DSX/National Geodetic Society DSData Extraction
  - Ashtech WinPrism and Mission Planner
  - Fillnet
- Vertical Control Software
  - Sound Velocity VelocWin
  - MS DOS SeaCat Profiler
  - Newiz Leveling Software
  - Tides LogPlot
  - Tides LogStat
  - Tides LogPrn Convert